

CLAIMS

1. A method for controlling a drive motor (20) of a positive displacement vacuum pump (16), the method comprising the following steps:

storing a curve (32) indicating a respective speed  $n$  of the drive motor (20) for inlet pressure values  $p$ , wherein the curve (32) comprises:

- an upper range (34) for inlet pressure values  $p$  larger than or equal to an upper limit pressure  $p_1$ , with a single constant upper speed value  $n_1$  being associated with said upper range (34), and
- an alteration range (36) for inlet pressure values  $p$  smaller than the upper limit pressure  $p_1$ , wherein in the alteration range different speed values  $n_v$  are associated with the inlet pressure values  $p$ ,

determining the inlet pressure value  $p$ ,

determining the speed  $n$  associated with the inlet pressure value  $p$  in the curve (32), and

operating the drive motor (20) at the determined speed  $n$ .

2. The method according to claim 1, characterized in that the curve (32) comprises a lower range (38) for inlet pressure values  $p$  smaller than or equal to a lower limit pressure  $p_2$ , a single constant lower speed value  $n_2$  is associated with the lower range (38), and the alteration range (36) is limited to inlet pressure values  $p$  larger than the lower limit pressure  $p_2$ .
3. A method for controlling a drive motor (20) of a positive displacement vacuum pump (16), the method comprising the following steps:

storing a curve (32) indicating a respective speed  $n$  of the drive motor (20) for inlet pressure values  $p$ , wherein the curve (32) comprises:

- a lower range (38) for inlet pressure values  $p$  smaller than or equal to a lower limit pressure  $p_2$ , with a single constant lower speed value  $n_2$  being associated with said lower range (38),
- an alteration range (36) for inlet pressure values  $p$  larger than the lower limit pressure  $p_2$ , wherein in the alteration range (36) different speed values  $n_v$  are associated with the inlet pressure values  $p$ ,

determining the inlet pressure value  $p$ ,

determining the speed  $n$  associated with the inlet pressure value  $p$  in the curve (32), and

operating the drive motor (20) at the determined speed  $n$ .

4. The method according to any one of claims 1-3, characterized in that in the alteration range (36) decreasing speeds  $n_v$  are associated with decreasing inlet pressure values  $p$ .
5. The method according to any one of claims 1-4, characterized in that the upper limit value  $p_1$  ranges between 20 mbar and 1 mbar, and the lower limit value  $p_2$  ranges between 1.0 mbar and 0.005 mbar.
6. The method according to any one of claims 1-5, characterized in that the upper constant speed value  $n_1$  ranges between 2,200 and 1,000 rpm, and the lower constant speed value  $n_2$  ranges between 300 and 1,300 rpm.

7. The method according to any one of claims 1-6, characterized in that the positive displacement vacuum pump (16) is a fore vacuum pump arranged upstream of a high vacuum pump (14), and the inlet pressure  $p$  is the suction-side pressure of the high vacuum pump (14).
8. The method according to any one of claims 1-7, characterized in that the curve (32) is saved in a characteristic diagram storage.
9. The method according to any one of claims 1-8, characterized in that the drive motor (20) is an asynchronous motor.
10. A positive displacement vacuum pump (16) comprising a drive motor (20), an inlet pressure sensor (24) and a drive motor control (22) for controlling the speed  $n$  of the drive motor (20) in dependence on the inlet pressure value  $p$  determined by the inlet pressure sensor (24),  
wherein the drive motor control (22) comprises a storage for storing a curve (32) which indicates a respective speed  $n$  of the drive motor (20) for inlet pressure values  $p$  of the inlet pressure sensor (24), wherein the curve (32) comprises:
  - an upper range (34) for inlet pressure values  $p$  larger than or equal to an upper limit pressure  $p_1$ , with a single constant upper speed value  $n_1$  being associated with said upper range (34), and
  - an alteration range (36) for inlet pressure values  $p$  smaller than the upper limit pressure  $p_1$ , wherein in the alteration range (36) different speed values  $n_v$  are associated with the inlet pressure values  $p$ .
11. The positive displacement vacuum pump according to claim 10, characterized in that the drive motor control (22) comprises a processor (28) which has connected therewith the inlet pressure sensor (24) and evaluates the signals of the inlet pressure sensor (24).